NEW CLAIMS

1. A method for preparing thermally stable, silicon-containing titanium dioxide, said method comprising the steps of: a) providing a starting material that is titanium hydroxide or titanium dioxide; b) reacting said starting material with a silica sol, under conditions which prevent the coagulation of silica particles in said sol, to obtain silicon-containing titanium hydroxide or silicon-containing titanium dioxide, and in the case of silicon-containing titanium hydroxide, heat treating the same to obtain silicon-containing titanium dioxide.

2. A method according to claim 1, wherein the starting masterial is titanium hydroxide obtained by a precipitation method which comprises the following steps:
a) providing an acidic aqueous solution containing inorganic salts of titanium and, if required, increasing the pH of the solution to a value above 0.02 but below the value at which precipitation of titanium hydroxide occurs, by introducing into said solution a first alkaline agent;
b) dissolving in said solution a precursor of an alkaline agent, and causing said precursor to generate said second alkaline agent and thereby to precipitate titanium hydroxide in the solution; and
c) separating and washing said precipitate of titanium hydroxide.

3. A method according to claim 2, wherein the first alkaline agent used in step b) is selected from the group consisting of ammonia, hydroxides and/or carbonates of alkali metals or alkaline earth metals.

4. A method according to claim 2, wherein the precursor of the alkaline agent used in step c) is urea, which, upon heating, is decomposed to generate a second alkaline agent which is ammonia.

5. A method according to claim 1, wherein the conditions which prevent the coagulation of silica particles in the silica sol are chosen from among stabilizing said silica sol with an alkaline agent or treating the titanium hydroxide or titanium dioxide starting material with an alkaline agent before it is contacted with the silica sol, to adjust the pH of said starting material to a value above 6.0, and preferably between 8 to 10.

6. A method according to claim 1, wherein the titanium hydroxide or titanium dioxide starting material is in a form chosen from among wet cake, aqueous suspension, dough or dry form.

7. A method according to claim 1, wherein the reaction is carried out at a temperature in the range between ambient to boiling point of the liquid phase, preferably in the range of 70-100°C.

8. A thermally stable titanium dioxide containing not more than 18% silicon, calculated in terms of SiO_2 on dry basis.

9. A thermally stable titanium dioxide according to claim 8, which is a single phase, having essentially the same composition at different points, as determined by the EDAX method.

10. A thermally stable titanium dioxide according to claim 7, having a specific surface area greater than 300 m^2/g, and a specific pore volume which is of at least 0.30 cc/g for pores having a diameter less than 100 nm.

11. A catalyst, comprising:
a) at least 3% w/w of a thermally stable titanium dioxide containing not more than 18% silicon;
b) A filler, preferably a silica filler; and, optionally
c) a binder.

12. A catalyst according to claim 11, wherein the silica filler present in the catalyst is diatomaceous earth.

13. A catalyst according to claim 11, wherein the binder is a colloidal solutions of silica or hydrogels of silicic acid.

14. A catalyst according to claim 11 prepared in the form of extrudates or in any other shape.

15. A catalyst according claim 11 for use in the Claus process.

16. A catalyst according to claim 11, which is capable of retaining a surface areas above 28 m^2/g after calcination at 800°C for 3 hours and retaining a surface areas above 120 m^2/g after hydrothermal treatment at 400°C for 5 hours.

17. A method for preparing titanium dioxide having high surface area and a well developed mesopore structure, comprising the steps of:

a) providing an acidic aqueous solution containing inorganic salts of titanium and, if required, increasing the pH of the solution to a value above 0.02 but below the value at which precipitation of titanium hydroxide occurs, by introducing into said solution a first alkaline agent;

b) dissolving in said solution a precursor of an alkaline agent, and causing said precursor to generate said second alkaline agent and thereby to precipitate titanium hydroxide in the solution; and

c) separating and washing said precipitate of titanium hydroxide and converting the same into titanium dioxide.